

Table of Contents

Preface	I
Organizing Committee	II
Honorary Committee	II
Scientific Program Committee	II
Local Organising Committee	III
Organizing Committee of the IWCSPP	IV
General Chair	IV
Vice Chairs	IV
Scientific Program Chair	V
Scientific Program Committee	V
Proceedings Editors and Co-Chairs	VI
Supporting Institutions.....	VIII
Sponsors	VIII
The International Working Conferences on Stored Product Protection	IX
Permanent Committee	IX
Past Conferences and Proceedings	IX
Proceedings of the International Working Conferences on Stored-Product Protection	X
Section: Around the World of Stored-Product Protection	3
Research on stored product protection in Australia: a review of past, present and future directions Collins, P.J.	3
Stored products research in Europe – a very personal perspective! Credland, P.	14
Stored product protection in Africa: Past, present and future Nukenine, E.N.	26
Overview of North American stored product research Throne, J.E.	42
The major achievements of grain storage in P. R. China Wang J.-J., Deng, Y.-X., Dou, W., Yang, Z.-L., Jiang, T.-K.	50
Challenges and characteristics of the South American grain and oilseed postharvest system Bartosik, R.	57

Section: Biology, Behaviour and Detection 63

Implications of the <i>Tribolium</i> genome project for pest biology Beeman, R.W., Arakane, Y., Phillips, T.W., Muthukrishnan, S.	63
Investigation of the semiochemicals of confused flour beetle <i>Tribolium confusum</i> Jaquelin du Val and grain weevil <i>Sitophilus granarius</i> (L.) in stored wheat grain and flour Abuelnnor, N.A., Jones, P.R.H., Ratcliffe, N.M., De Lacy Costello, B., Spencer-Phillips, P.T.N.	72
Efficiency comparison of three attractant products against webbing clothes moth <i>Tineola bisselliella</i> (Hummel) (Lepidoptera: Tineidae) using an adapted four arms olfactometer Arnault, I., Decoux, M., De Reyer, D., Auger, J.	77
Pheromone traps for monitoring <i>Plodia interpunctella</i> (Hübner) (Lepidoptera: Pyralidae) in the presence of mating disruption Burks, C.S., Brandl, D.G., Kuenen, L.P.S., Reyes, C.C., Fisher, J.M.	79
Genetic structure of <i>Tribolium castaneum</i> populations in mills Semeao, A.A., Campbell, J.F., Beeman, R.W., Whitworth, R.J., Sloderbeck, P.E., Lorenzen, M.D.	85
Molecular markers for <i>Psocoptera</i> species identification Ceruti, F.C., Lazzari, S.M.N.	90
<i>Tricorynus rudepunctatus</i> (Pic) (Coleoptera: Anobiidae): diagnosis and damage Ceruti, F.C., Lazzari, S.M.N., Neto, G.H.R.	91
<i>Hylotrupes bajulus</i> (L.) (Col., Cerambycidae): nutrition and attacked material Chiappini, E., Molinari, P., Busconi, M., Callegari, M., Fogher, C., Bani, P.	97
Resistance management and the ecology of <i>Rhyzopertha dominica</i> (F.) and <i>Tribolium castaneum</i> (Herbst) in subtropical Australia Daglish, G.J., Ridley, A.W., Walter, G.H.	104
On automatic bioacoustic detection of stored product pests: the case of <i>Sitophilus oryzae</i> Potamitis, I., Ganchev, T., Kontodimas, D.C., Eliopoulos, P.A.	110
A systemic approach of qualitative changes in the stored wheat ecosystem: prediction of deterioration risks in unsafe storage conditions in relation to relative humidity, infestation by <i>Sitophilus oryzae</i> (L.), and variety influence Fourar-Belaifa, R., Fleurat-Lessard, F., Bouznad, Z.	111
Conscent PE mating disruption system is an effective alternative to methyl bromide for the control of stored product moths Hassan, M.N., Al-Zaidi, S.	118
Behavioural effects of pheromone-based control system, Exosex TM SPTab, on male Indianmeal moth, <i>Plodia interpunctella</i> Huggett, N.J., Storm, C.G., Smith, M.J.	119
Study on volatile compounds in rice by HS-SPME and GC-MS Lin, J.-Y., Fan, W., Gao, Y.-N., Wu, S.-F., Wang, S.-X.	125
External egg morphology of common stored-product pests from the families Anobiidae (Ptininae) and Dermestidae (Coleoptera) Kučerová, Z., Hromádková, J., Stejskal, V.	135
Intra and interspecific variation assessment in Psocoptera using near spectroscopy Lazzari, S.M.N., Ceruti, F.C., Rodriguez-Fernandez, J.I., Opit, G., Lazzari, F.A.	139
From RFLP, specific primer to DNA Barcoding: preliminary study on molecular identification of common stored product psocid Li, Z.-H., Kučerová, Z., Zhao, S., Qin, M., Opit, G.P., Stejskal, V., Kalinović, I., Yang, Q.	145
Egg hatching at different temperatures and relative humidities in <i>Idaea inquinata</i> (Scopoli) (Lepidoptera: Geometridae)	147

Limonta, L., Stampini, M., Locatelli, D.P.	
How methodical approaches affects results of pest sampling in stores and counting in laboratory	150
Lukas, J., Kučerová, Z., Aulický, R., Stejskal, V.	
Some biological characteristics of the <i>Batrachedra amydraula</i> Meyrick (Lepidoptera: Batrachedridae) on main varieties of dry and semi-dry date palm of Iran	151
Shayesteh, N., Marouf, A., Amir-Maafi, M.	
The influence of a DDGS diet on the development and oviposition rate of <i>Tribolium castaneum</i> (Herbst)	156
Fardisi, M., Mason, L.J., Klein, E.I.	
Mating disruption field trials on <i>Plodia interpunctella</i> (Hubner)	160
Mueller, D.	
The chemical composition of egg plugs deposited by <i>Sitophilus granarius</i> L. females on grain	161
Szewczuk, Z., Stefanowicz, P., Nawrot, J.	
Resistance of strains of rice weevil, <i>Sitophilus oryzae</i> (Coleoptera: Curculionidae) to pirimiphos methyl	167
Odeyemi, O.O., Ashamo, M.O., Akinkurolere, R.O., Olatunji, A.A.	
Ecological studies of the Psocids <i>Liposcelis brunnea</i> , <i>L. rufa</i> , <i>L. pearmani</i> , and <i>Lepinotus reticulatus</i>	173
Opit, G.P., Gautam, S.G., Aminatou B.A., Throne, J.E.	
Applications of semiochemicals for managing stored-product insects: research and product development	180
Phillips, T.W., Mahroof, R.M., Hasan, M.M., Edde, P.A., Campos-Figueroa, M.	
Regulation of the pheromone biosynthetic pathway in the Indian meal moth	181
Tsfadia, O., Zada, A., Roelofs, W., Rafaeli, A.	
Are the volatile chemicals from wheat and grain insect (<i>Tribolium castaneum</i> (Herbst), <i>Rhyzopertha dominica</i> (F.) and <i>Sitophilus granarius</i> (L.)) related with inter-communication between insects and host?	182
Ren, Y.L., Cai, L.J., Macfadyen, S., Desmarchelier, J.	
Efficacy of pheromone-based control system, Exosex TM SPTab, against moth pests in European food processing facilities	183
Pease, G., Cai, L.I., Storm, C.G.	
Monitoring of arthropod infestations on high quality hard wheat in southern Italy	190
Suma, P., Russo, A., La Torre, I., Gallo, G.	
Invasion and threats of <i>Acanthoscelides obtectus</i> (Say) (Coleoptera: Bruchidae) to kidney beans in India - a first record	193
Thakur, D.R.	
Seasonal dynamics of three lepidopteran stored grain pests in Slovenia	197
Trdan, S., Kač, M., Vidrih, M., Laznik, Ž.	
Partial characterization of glutathione S-transferases from different field populations of <i>Liposcelis bostrychophila</i>	202
Dou, W., Niu, J.-Z., Xiao, L.-S., Deng, Y.-X., Wang, J.-J.	
Development, relative retention, and fecundity of <i>Tribolium castaneum</i> (Herbst) on different starches	207
Xue, M., Subramanyam, B., Shi, Y.-C., Campbell, J., Hartzler, M.	
National investigations of stored grain arthropods in China	212
Yan, X., Zhou, H., Shen, Z., Li, W., Guo, D., Song, Y., Lan, S., Zhang, J.	

Section: Engineering 219

Protecting and disinfecting stored products by drying and cooling, and disinfecting stored products during handling by mechanical treatments Beckett, S.J.	219
Economic decision-making model for best ozonation treatment system for stored-product protection Maier, D.E., Campabadal, C.A.	229
Comparison of leakage rates of methyl bromide and sulfuryl fluoride during structural fumigations Maier, D.E., Subramanyam, B., Chayaprasert, W.	230
A simplified and improved modeling approach for the structural fumigation process using computational fluid dynamics Chayaprasert, W., Maier, D.E., Subramanyam, B.	237
The specific heat of wheat Cao, Y., Li, G., Zhang, Z., Chen, L., Li, Y., Zhang, T.	243
Dust explosions: A report on recent major explosions in Argentina and Brazil Hajnal, R.D.	250
Identification of stored-grain insects using microwave/RF electric fields Jones, C.L.	256
The sorption isosteric heats of rice grains in China Li, X.-J., Wu, Z.-D., Zhang, Z.-J., Lu, H., Lin, J.-Y., Cao, Y.	257
Effects of preconditioning on quality of dried blueberries Somsong, P., Srzednicki, G., Konczak, I., Lohachoompol, V.	264
Effect of nut-in-shell storage conditions on volatile profile in macadamia nuts Srichamnong, W., Wootton, M., Srzednicki, G.	270
Modelling of seed drying in fluidised and spouted bed dryers Jittanit, W., Srzednicki, G., Driscoll, R.	275
Omni-science: transformative approaches to postharvest technology Thorpe, G.	281
Research on the space temperature control of grain bins with groundwater and heat exchanger Shen, Y., Xu, J., Wu, Z., Gao, B., Cao, Y., Zhang, T.	289
Study on in-store drying technology of paddy in China Guo, D., Yang, J., Luo, H., Fu, P., Wang, S., Li, Y.	295

Section: Fumigation, Modified Atmospheres and Hermetic Storage..... 303

Quo Vadis the fumigants? Emekci, M.	303
Cost comparison of Methyl Bromide and Sulfuryl Fluoride (ProFume®) for fumigating food processing facilities, warehouses, and cocoa beans Adam, B.D., Bonjour, E.L., Criswell, J.T.	314
Presentation of results of fumigation of different commodities and fumigation of resistant insect species with Quickphlo-R phosphine generator Asher, P.P.	322
Storage of canola in hermetic plastic bags Ochandio, D.C., Cardoso, L.M., Bartosik, R.E., De la Torre, D.A., Rodríguez, J.C., Massigoge, J.	323

Storage of quality malting barley in hermetic plastic bags Ochandio, D.C., Cardoso, L.M., Bartosik, R.E., De la Torre, D.A., Rodríguez, J.C., Massigoge, J.	331
Non-chemical on-farm hermetic maize storage in east Africa Yakubu, A., Bern, C.J., Coats, J.R., Bailey, T.B.	338
Continuous ozonation treatment systems as other alternative more efficient grain protection technologies Maier, D.E., Campabadal, C.A., Woloshuk, C.P., Mason, L.	346
Structural fumigation efficacy against <i>Tribolium castaneum</i> in flour mills Campbell, J.F., Toews, M.D., Arthur, F.H., Arbogast, R.T.	352
Methyl iodide: a potential fumigant for post-harvest and quarantine disinfestation Ciesla, Y., Ducom, P., Fritsch, J.	358
New prospects for ethyl formate as a fumigant for the date industry Finkelman, S., Lendler, E., Navarro, S., Navarro, H., Ashbell, G.	359
Methyl bromide and sulfuryl fluoride effectiveness against red flour beetle life stages Hartzer, M., Subramanyam, B., Chayaprasert, W., Maier, D.E., Savoldelli, S., Campbell, J.F., Flinn, P.W.	365
Fumigant toxicity of garlic essential oil in combination with carbon dioxide (CO ₂) against stored-product insects İşikber, A.A.	371
Improvement of phosphine fumigation by the use of Speedbox Kostyukovsky, M., Trostanetsky, A., Yasinov, G., Menashero, M., Hazan, T.	377
Half-life time of ozone as a function of air conditions and movement McClurkin, J.D., Maier, D.E.	381
Ozone technology in the post-harvest storage environment- a comparison of efficacy of high doses of ozone to insects treated under laboratory conditions and field conditions McDonough, M.X., Mason, L.J., Woloshuk, C., Campabadal, C.,	386
How is sulfuryl fluoride performing as a methyl bromide alternative? Mueller J.B.	389
A novel approach to the protection of cocoa beans by preventing free fatty acid formation under hermetic storage Navarro, S., Navarro, H., Finkelman, S., Jonfia-Essien, W.A.	390
Developing strategies to manage highly phosphine resistant populations of flat grain beetles in large bulk storages in Australia Nayak, M., Holloway, J., Pavic, H., Head, M., Reid, R., Patrick, C.	396
Integration of monoterpenoids with low pressure simulating vacuum for control of diapausing Indian meal moth larvae and red flour beetle adults Mbata, G., Pascual-Villalobos, M.J.	402
Evaluation of headspace Solid Phase Micro-extraction method for analysis of phosphine residues in wheat Ren, Y.L., Padovan, B.	407
The use of carbon dioxide in big bags and containers for the control of pest in food products Pons, M.J., Cámara, A.G., Guri, S., Riudavets, J.	414
Pre-Mix and on-site mixing of fumigants Ryan, R.F., Shore, W.P.	419
ETHOXOFUME 1000 (EtO): methyl bromide alternative update Ryan, R.F., Nicolson, J., Bishop S.R.	423
Destruction of toxic and environmental harmful gases Ryan, R.F., McMahon, J.B.	427

Phosphine generator trial using external air dilution Ryan, R.F., Shore, W.P., Newman, C.J.E.	430
Alternative fumigants to methyl bromide for the control of pest infestation in grain and dry food products Shaaya, E., Kostyukovsky, M.	433
Life stage and resistance effects in modelling phosphine fumigation of <i>Rhyzopertha dominica</i> (F.) Thorne, J., Fulford, G., Ridley, A., Schlipalius, D., Collins, P.	438
New applications of hermetic storage for grain storage and transport Villers, P., Navarro, S., De Bruin, T.	446
Mortality time of immature stages of susceptible and resistant strains of <i>Sitophilus oryzae</i> (L.) exposed to different phosphine concentrations Wang, D-X., Ma, X-H., Bian, K.	452
Fumigation activities of ethyl formate on different strains of <i>Liposcelis bostrychophila</i> Deng, Y-X., Wang, J-J., Dou, W., Yang, Z-L., Jiang, T-K.	459
A study of fumigation toxicity of horseradish essential oil against two stored grain insects Xie, L-D., He, Y-P., Chen, S-S., Xu, L., He, J.	464
Generation of phosphine gas for the control of grain storage pests Zhao, B.X.	469
Study on the mortality of the stored-grain insects adults in different concentrations of low oxygen Cao, Y., Gao, S., Qu, G., Li, Y., Li, G.	476

Section: Microbiology, Mycotoxins and Food Safety 484

Elimination of post-harvest and pre-harvest aflatoxin contamination Bhatnagar, D.	484
Aspects of the methodology validation for light filth in fruit pulp Dimov, M.N., Atui, M.B., Silva, A.M., Marciano, M.A.M., Franco, V.P.A., Chasin, L.B., Silva, L.A., Fioravanti, M.I.A., Oliveira, M.M.L.	485
Evaluation of contamination for extraneous materials in “sun meat” sold in the “houses of the north” in the municipality of Diadema (SP, Brazil) Mennuci, T.A., Marciano, M.A.M., Atui, M.B., Poli Neto, A., Germano, P.M.L.	489
Assessment of hygienic conditions of ground pepper (<i>Piper nigrum</i> L.) on the market in São Paulo city, by means of two methodologies for detecting the light filth Atui, M.B., Castejon, M.J., Yamashiro, R., De Lucca, T., Flinn, P.W.	495
Toxigenic fungi in corn (maize) stored in hermetic plastic bags Castellari, C., Marcos Valle, F., Mutti, J., Cardoso, L., Bartosik, R.	501
Monitoring carbon dioxide concentration for early detection of spoilage in stored grain Maier, D.E., Channaiah, L.H., Martinez-Kawas, A., Lawrence, J.S., Chaves, E.V., Coradi, P.C., Fromme, G.A.	505
<i>Aspergillus flavus</i> infection and aflatoxin contamination in peanuts stored at wholesale and retail levels in Bandung, Bogor and Jakarta (West Java, Indonesia) Dharmaputra, O.S., Retnowati, I., Ambarwati, S.	510
Multivariate analysis of the temporal changes of fungal communities in unsafe storage conditions of some common wheat varieties in relation to relative humidity level and rice weevil infestation Fleurat-Lessard, F., Fourar-Belaifa, R., Bouznad, Z.	518
Effect of essential oils from <i>Eucalyptus</i> on the growth of aflatoxigenic species Mengai, B., Steffen Almeida, G., Cuccovia Mazotti, N.C., Tadeu dos Santos Dias, C., Moreira e Moreira, R., Gomes Vieira, I., Da Silva, M.F.G.F., Cruz Silva, S., Calori Domingues, M.A., Da Gloria, E.M.	527
Aflatoxin control and prevention strategies in maize for Sub-Saharan Africa Hell, K., Mutegi, C., Fandohan, P.	534

The use of essential oils to protect rice from storage fungi Magro, A., Matos, O., Bastos, M., Carolino, M., Lima, A., Mexia, A.	542
Ozone treatment effects on microbial count on maize McClurkin, J.D., Maier, D.E.,	548
<i>Bt</i> maize: a tool for improving food safety of grains at harvest Regnault-Roger, C., Folcher, L., Delos, M., Jarry, M., Weissenberger, A., Eychenne, N.	553
Effect of oxygen reducing atmospheres on the quality and safety of stored shelled Brazil nut packs Scussel, V.M., Tanello, A.C., Giordano, B.N., Manfio, D., Galvão, S., Rodrigues, M.N.F.	560
Reduction of in-shell Brazil nut (<i>Bertholletia excelsa</i> H.B.K.) aflatoxin contamination by ozone gas application during storage Giordano, B.N.E., Simao, V., Manfio, D., Galvao, S., Scussel, J.N., Scussel, V.M.	566
Use of technology radiation as a method of reducing the microorganism and conservation postharvest of caja during storage Silva, J.M., Correia, L.C.S.A., De Moura, N.P., Maciel, M.I.S., Villar, H.P.	573
Antifungal activity of extracts of <i>Ocimum gratissimum</i> and <i>Aframomum danielli</i> against moulds isolated from stored rice Bankole, S.A., Somorin, Y.M.	578
Can ozone fumigation effectively reduce aflatoxin B ₁ and other mycotoxins contamination on stored grain? Wang, S., Liu, H., Lin, J., Cao, Y.	582
Contribution of the light filth method to the Integrated Pest Management of a flour mill Trematerra, P., Catalano, S.	589

Section: Non-Chemical Control 596

Biological control of stored-product insects in commodities, food processing facilities and museums Schöller, M.	596
Bio-rational control of red flour beetle <i>Tribolium castaneum</i> (Herbst) in stored wheat with Calneem® oil derived from neem seeds Adarkwah, C., Obeng-Ofori, D., Büttner, C., Reichmuth, C., Schöller, M.	607
Low temperature to control <i>Plodia interpunctella</i> and <i>Stegobium paniceum</i> Adler, C.	608
Repellent activity of two medicinal plant essential oils on <i>Tribolium castaneum</i> and <i>Ephesia kuehniella</i> Akrami, H., Moharrampour, S., Imani, S.	614
Potential of plant products as protectants of stored maize against <i>Sitophilus zeamais</i> Motschulsky (Coleoptera:Curculionidae) Conceição, C., Barbosa, A., Matos, O., Mexia, A.	615
Structural heat treatments against <i>Tribolium castaneum</i> (Herbst) (Coleoptera: Tenebrionidae): effect of flour depth, life stage and floor Brijwani, M., Subramanyam, B., Flinn, P.W., Langemeier, M.R.	622
Non-chemical alternative in rice storage: the use of refrigeration for insect control and quality maintenance of paddy rice Barbosa, A., Carvalho, M.O., Barros, G., Pires, I., Riudavets, J., Navarro, S.	628
The effect of ultraviolet C radiation on stored-product pests Collins, D.A., Kitchingman, L.	632
Survival of adults and larvae of grain beetles at lethal low temperature Eliopoulos, P.A., Prasodimou, G.Z., Pouliou, A.V.	637

Impact of kaolin-based particle film dusts on <i>Callosobruchus maculatus</i> (F.) and <i>C. chinensis</i> (L.) after different storage periods of treated broad bean seeds	638
Mahmoud, A.E.M., El-Sebai, O.A., Shahen, A.A., Marzouk, A.A.	
The effect of diapause, cold acclimation and ice-nucleating bacteria on the cold-hardiness of <i>Plodia interpunctella</i>	647
Fields, P.G., Timlick, B.	
Insecticidal properties of whole meal or protein extracts of the bean seeds <i>Phaseolus vulgaris</i> L. on juvenile stages of <i>Callosobruchus maculatus</i> (F.) (Coleoptera: Bruchidae)	654
Mouhouche, F., Karbache, F., Fleurat-Lessard, F.	
Heat treatment: A viable methyl bromide alternative for managing stored-product insects in food-processing facilities	661
Hulasare, R., Subramanyam, B., Fields, P.G., Abdelghany, A.Y.	
Suppression of the population of <i>Lasioderma serricorne</i> in stored tobacco by relocation of warehouses to cooler areas	668
Imai, T.	
The control of the drugstore beetle, <i>Stegobium paniceum</i> (Coleoptera: Anobiidae) with high and low temperatures	671
Abdelghany, A.Y., Awadalla, S.S., Abdel-Baky, N.F., EL-Syrafı, H.A., Fields, P.G.	
Egg removal device for the management of three stored product pests	673
Jayaprakash, S.A., Mohan, S., Ramaraju, K.	
Development and comparison of two models to predict survival rates of young larvae of <i>Stegobium paniceum</i> (L.) (Coleoptera: Anobiidae) under heat treated temperatures	678
Jian, F., Jayas, D.S., Fields, P.G., Abdelghany, A.Y.	
Radio frequency treatments for insect disinfestation of dried legumes	688
Johnson, J.A., Wang, S., Tang, J.	
Effectiveness of flameless catalytic infrared radiation against life stages of three stored-product insect species in stored wheat	695
Khamis, M., Subramanyam, B., Dogan, H., Flinn, P.W., Gwirtz, J.A.	
Laboratory evaluation of diatomaceous earth against main stored product insects	701
Kostyukovsky, M., Trostanetsky, A., Menasherov, M., Yasinov, G., Hazan, T.	
Analysis of monoterpenoids in inclusion complexes with β -cyclodextrin and study on ratio effect in these microcapsules	705
López, M.D., Pascual-Villalobos, M.J.	
Environmentally friendly technologies to maintain stored paddy rice quality	710
Lazzari, F.A., Lazzari, S.M.N., Lazzari, F.N.	
Contact and fumigant activity of 1,8-cineole, eugenol and camphor against <i>Tribolium castaneum</i> (Herbst)	716
Liska, A., Rozman, V., Kalinovic, I., Ivezic, M., Balicevic, R.	
Penetration ability of <i>Holepyris sylvanidis</i> into the feeding substrate of its host <i>Tribolium confusum</i>	721
Lorenz, S., Adler, C., Reichmuth, C.	
<i>Liotryphon punctulatus</i> (Ratzeburg, 1848) (Hymenoptera: Ichneumonidae) – a parasitoid of <i>Ephestia kuehniella</i> larvae	726
Lukas, J., Stejskal, V.	
Using aeration and insulation to reduce grain temperature in China grain warehouses	729
Lu, J., Zhu, Q., Jia, S., An, X., Wang, F.	
Insecticidal effect of anisaldehyde against <i>Acanthoscelides obtectus</i> and <i>Callosobruchus maculatus</i> (Coleoptera: Bruchidae)	735
Ndomo, A.F., Tapondjou, L.A., Tchouanguep, F.M.	

Distribution of insect pests and their natural enemies in a barley pile Belda, C., Riudavets, J.	741
Biological activity of essential oils of <i>Alpinia conchigera</i> rhizome against <i>Sitophilus zeamais</i> and <i>Tribolium castaneum</i> Suthisut, D., Fields, P.G., Chandrapatya, A.	746
Mass trapping of <i>Ephestia kuehniella</i> Zeller in a traditional flour mill Trematerra, P., Gentile, P.	748
Comparing flower nectar and artificial diet on the longevity and progeny production of <i>Trichogramma turkestanica</i> Tuncbilek, A.S., Cinar, N., Canpolat, U.	754
Suppression of <i>Sitophilus zeamais</i> Motschulsky by the ectoparasitoid, <i>Anisopteromalus calandrae</i> (Howard) Visarathanonth, P., Kengkanpanich, R., Uraichuen, J., Thongpan, J.	755
Progress in the development of a biopesticide for the structural treatment of grain stores Wakefield, M.E., Moore, D., Luke, B., Taylor, B., Storm, C.G., Collins, D.A., Grammare, P., Potin, O.	760
Study on the insecticidal activity compounds of the essential oil from <i>Syzygium aromaticum</i> against stored grain insect pests Zeng, L., Lao, C.Z., Cen, Y.J., Liang, G.W.	766
Combination of <i>Bacillus thuringiensis</i> and <i>Habrobracon hebetor</i> for the biological control of <i>Plodia interpunctella</i> Akinkulore R.O., Zhang, H.	772
Section: Residual Insecticides – Synthetic and Botanical	774
Residual insecticides, inert dusts and botanicals for the protection of durable stored products against pest infestation in developing countries Obeng-Ofori, D.	774
Residual efficacy of aerosols to control <i>Tribolium castaneum</i> and <i>Tribolium confusum</i> Arthur, F.H.	789
Management of the yam moth, <i>Dasydes rugosella</i> Stainton, a pest of stored yam tubers (<i>Dioscorea</i> spp.) using plant products Ashamo, M.O.	793
Effect of four powdered spices as repellents against adults of <i>Rhyzopertha dominica</i> (F.), <i>Sitophilus granarius</i> (L.) and <i>Tribolium castaneum</i> (Herbst) in laboratory conditions Shayesteh, N., Ashouri, S.	799
Efficacy of insecticides for control of stored-product psocids Athanassiou, C.G., Arthur, F.H., Throne, J.E., Opit, G.P., Hasan, M.M., Aikins, M.J., Phillips, T.W., Kavallieratos, N.G.	805
Efficacy of dust formulations of spinosad for controlling insects infesting stored wheat Bonjour, E.L., Opit, G.P.	815
Horizontal transfer of methoprene in <i>Tribolium castaneum</i> Tucker, A.M., Campbell, J., Arthur, F.H., Zhu, K.Y.	819
Deltamethrin residues through the food chain industries Cognard, C.	825
Cross-contamination of oilseeds by insecticide residues during storage Dauguet, S., Fleurat-Lessard, F., Loison, J.	827
Toxicity of powder and extracts of <i>Zanthoxylum zanthoxyloides</i> Lam (Rutaceae) root bark from Nigeria to three storage beetles Denloye, A.A., Makanjuola, W.A., Ajelara, O., Akinlaye, O.J., Olowu, R.A., Lawal, O.A.	833

A comparison of the effect of two diatomaceous earth formulations on <i>Plodia interpunctella</i> (Hübner) and the effect of different commodities on diatomaceous earth efficacy Timlick, B., Fields, P.G.	840
Altered proteolytic and amyolytic activity in insecticide-susceptible and -resistant strains of the maize weevil, <i>Sitophilus zeamais</i> Silva, L.B., Lopes, K.V.G., Oliveira, M.G.A., Guedes, R.N.C.	845
Physiological and behavioral resistance to esfenvalerate + fenitrothion in populations of the maize weevil, <i>Sitophilus zeamais</i> Corrêa, A.S., Cordeiro, E.M.G., Braga, L.S., Pereira E.J.G., Guedes, R.N.C.	851
Long term effectiveness of the mixture of diatomaceous earth and deltamethrin on wheat Korunic, Z., Kalinovic, I., Liska, A., Hamel, D.	858
Laboratory evaluation of insecticidal effectiveness of a natural zeolite formulation against <i>Sitophilus oryzae</i> (L.), <i>Rhyzopertha dominica</i> (F.) and <i>Tribolium castaneum</i> (Herbst) in treated wheat Kljajić, P., Andrić, G., Adamović, M., Pražić Golić, M.	863
Susceptibility of red flour beetle <i>Tribolium castaneum</i> (Herbst) populations from Serbia to contact insecticides Andrić, G., Kljajić, P., Perić, I., Pražić Golić, M.	869
Bioefficacy of plant derivatives on the repellency, damage assessment and progeny production of the cowpea weevil, <i>Callosobruchus maculatus</i> (F.) (Coleoptera: Bruchidae) Murugan K.	874
Efficacy of diatomaceous earth and botanical powders against the maize weevil, <i>Sitophilus zeamais</i> Motschulsky (Coleoptera: Curculionidae) on maize Nukenne, E.K., Goudougou, J.W., Adler, C., Reichmuth, C.	881
Australian national residue survey – closing the loop on pesticide residue risk management for Australian grain Reichstein, I., Healy, K., James, A., Murray, B.	888
A synergistic mixture of diatomaceous earth and deltamethrin to control stored grain insects Korunic, Z., Rozman, V.	894
Field trials with the diatomaceous earth SilicoSec [®] for treatment of empty rooms and bulk grain Schöller, M., Reichmuth, C.	899
Efficacy of propionic acid against the granary weevil <i>Sitophilus granarius</i> (L.) Lorenz, S., Schöller, M., Reichmuth, C.	906
A novel natural insecticide molecule for grain protection Rajashekar, Y., Shivanandappa, T.	910
Human behaviour and application of residual insecticides to control storage and food industry pests Stejskal, V., Aulický, R.	916
Insecticidal action of the combined use of spinosad and deltamethrin against three stored-product pests in two stored hard-wheat varieties. Vayias, B.J., Kavallieratos, N.G., Athanassiou, C.G., Tatsi, G.	919
Mortality and suppression of progeny production of <i>Sitophilus oryzae</i> (L.) (Coleoptera: Curculionidae) and <i>Tribolium confusum</i> Jacquelin du Val (Coleoptera: Tenebrionidae) in seven different grains treated with an enhanced diatomaceous earth formulation Kavallieratos, N.G., Athanassiou, C.G., Vayias, B.J., Boukouvala, M.	923
Influence of temperature and relative humidity on the efficacy of diatomaceous earth and <i>Metarhizium anisopliae</i> (Metschnikoff) Sorokin (Hyphomycetes: Deuteromycotina) against <i>Tyrophagus fatimii</i> F. (Astigmata: Acaridae) Wakil, W., Ghazanfar, M.U., Mustafa, F.	930

Efficacy assessment of diatomaceous earth against <i>Callosobruchus maculatus</i> (F.) (Coleoptera: Bruchidae) on gram at different temperature and relative humidity regimes Wakil, W., Ghazanfar, M.U., Ashfaq, M., Ali, K., Riasat, T.	936
Effects of methoprene on extreme temperature tolerance and reproduction of <i>Tribolium castaneum</i> (Coleoptera: Tenebrionidae) Wijayaratne, L.K.W., Fields, P.G.	942
Evaluation of inert dusts against phosphine resistant strains of <i>Cryptolestes ferrugineus</i> Cao, Y., Li, Y., Li, G.	943
Study on the distribution of deltamethrin residues in stored wheat using sequential fractionation procedure Zhang, Y., Wang, S.	947
Section: Integrated Pest Management	948
Optimizing heat treatments for management of stored-product insects in food-processing facilities Subramanyam, B.	948
Fluorescent non-toxic bait as a new method for black rat (<i>Rattus rattus</i>) monitoring Aulický, R., Fraňková, M., Rödl, P., Eliášová, B., Frynta, D., Stejskal, V.	950
Simulation model of the red flour beetle in flour mills Flinn, P.W., Campbell, J.F., Throne, J.E., Subramanyam, B.	953
African Postharvest Losses Information System – a network for the estimation of cereal weight losses Hodges, R.J., Bernard, M., Knipschild, H., Rembold, F.	956
Effect of storage management on free fatty acid content in dry cocoa beans Jonfía-Essien, W.A., Navarro, S.	963
Spatial distribution of stored grain insects in a rice storage and processing facility in Brazil Lazzari, F.N., Lazzari, F.A., Lazzari, S.M.N., Ceruti, F.C.	969
The potential of transgenic legumes in integrated bruchid management: assessing the impact on bruchid parasitoids Lüthi, C., Álvarez-Alfageme, F., Romeis, J.	977
Influence of Sanitation on Post-Fumigation Pest Rebound Mason, L., Tsai, W., Ileleji, K.	983
Post-harvest technology transfer to reduce on farm grain losses in Kitui district, Kenya Mutambuki, K., Ngatia, C.M., Mbugua, J.N.	984
Integrated control of <i>Ephestia cautella</i> (Walker) in a confectionary factory Savoldelli, S., Süß, L.	991
Arthropod monitoring in an automated pasta warehouse Savoldelli, S., Bruschi, E.	993
Early detection of insect infestation in stored grain based on head space analysis of volatile compounds Laopongsit, W., Szrednicki, G.	999
Summary of commercially available pheromones of common stored-product beetles Swords, P., Van Ryckeghem, A.	1004
Summary of commercially available pheromones of common stored product moths Swords, P., Van Ryckeghem, A.	1008
Protection of stored plant products from rodent pests using chlorophacinone Vukša, M., Đedović, S., Jokić, G., Stojnić, B.	1011

The development of grain storage scientific and technical research in China and relevant theory exploration	1016
Jin, Z., Song, W., Guo, D., Lan, S., Xu, H., Tao, C., Wang, H., Tang, P.	

Section: Quarantine and Regulatory 1023

Phaseout of methyl bromide as a fumigant – will PQS uses continue?	1023
Banks, J.	
Review of research on the control of pine wood nematode (<i>Bursaphelenchus xylophilus</i>) using the fumigant sulfuryl fluoride and current status for inclusion in ISPM No.15	1024
Buckley, S., Drinkall, M.J., Thoms, E.M.	
The use of hand-held computers (PDAs) to audit and validate eradication of a post-border detection of Khapra Beetle, <i>Trogoderma granarium</i> , in Western Australia	1031
Emery, R.E., Chami, M., Garel, N., Kostas, E., Hardie, D.C.	
A novel approach to limit the development of phosphine resistance in Western Australia	1038
Newman, C.R.	
Evaluation of ozone treatment in vacuum for in-shell Brazil nuts shipment and aflatoxins	1045
Scussel, V.M., Giordano, B.N.E., Simao, V., Manfio, D., Galvao, S., Scussel, J.N.	
Profitable chemical-free cowpea storage technology for smallholder farmers in Africa: opportunities and challenges	1046
Baributsa, D., Lowenberg-DeBoer, J., Murdock, L., Moussa, B.	

Index of Authors 1053